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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/581,394

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EXAMINER

MARTIN, ANGELA J

ART UNIT

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1795

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/581,394	Applicant(s) AOYAMA ET AL.	
	Examiner Angela J. Martin	Art Unit 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 January 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) _____ is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☒ Claim(s) 1-21 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>2/21/08</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

This Office Action is responsive to the Amendment filed on January 24, 2008. Applicant added a new claim 21. However, a restriction is presented for the following reasons of record.

Election/Restrictions

1. This application contains claims directed to more than one species of the generic invention. These species are deemed to lack unity of invention because they are not so linked as to form a single general inventive concept under PCT Rule 13.1.

The species are as follows:

Species I (claims 1-3, 5, 20); Species II (claims 4, 5, 20); Species III (claims 6-9, 20); Species IV (claims 10-12, 20); Species V (claims 13-15, 20); Species VI (claims 16, 17, 20); Species VII (claims 18, 20); Species VIII (claims 19, 20); Species IX (claims 20, 21)

Applicant is required, in reply to this action, to elect a single species to which the claims shall be restricted if no generic claim is finally held to be allowable. The reply must also identify the claims readable on the elected species, including any claims subsequently added. An argument that a claim is allowable or that all claims are generic is considered non-responsive unless accompanied by an election.

Upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which are written in dependent form or otherwise include

all the limitations of an allowed generic claim as provided by 37 CFR 1.141. If claims are added after the election, applicant must indicate which are readable upon the elected species. MPEP § 809.02(a).

2. The claims are deemed to correspond to the species listed above in the following manner (according to the PCT filed on 6/2/06):

1-3, 5 (partly), 20 (partly)

Claims 1-2 disclose a method of manufacturing a fuel cell by forming a thin electrolyte layer having pores on an hydrogen permeable layer, forming a conductive layer having *electrical* conductivity on the thin electrolyte layer and *electronically-discontinued* with the hydrogen-permeable layer via the pores.

Claims 3 and 5 disclose a method of forming said conductive layer by releasing a conductive material perpendicularly toward the electrolyte layer.

Claim 20 discloses a fuel cell manufactured according to claims 1-3 and 5.

4, 5 (partly), 20 (partly)

Claims 4-5 disclose a method of forming the *conductive* layer by releasing a conductive material toward the electrolyte layer at a specific angle.

Claim 20 discloses a fuel cell manufactured according to claims 4-5.

6-9, 20 (partly)

Claims 6-9 disclose a method of forming the conductive layer by first forming a dielectric layer in the pores present in the *electrolyte* layer, said dielectric layer being made mainly of an insulating material, before coating the *electrolyte* layer and the *dielectric* layer with the *conductive* layer.

Claim 20 discloses a fuel *cell* manufactured according to claims 6-9.

10-12, 20 (partly)

Claims 10-12 disclose a method of forming the conductive layer by first filling the pores present in the electrolyte layer with fine particles, forming the conductive layer on the electrolyte layer having the pores filled with the fine particles and removing the fine particles from the pores.

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Claim 20 discloses a fuel cell manufactured according to claims 10-12.

13-15, 20 (partly)

Claims 13-15 disclose a method of forming the conductive layer by first forming a protective layer to cover the electrolyte layer before forming the conductive layer on the protective layer.

Claim 20 discloses a fuel cell manufactured according to claims 13-15.

16-17, 20 (partly)

Claims 16-17 disclose a method of forming the conductive layer by coating the electrolyte layer with particles of an electrically *conductive* material having a greater particle diameter than a width of the pores present in the electrolyte layer.

Claim 20 discloses a fuel cell manufactured according to claims 16-17.

18, 20 (partly)

Claim 18 discloses a method of forming the conductive layer by applying a paste, which contains an electrically conductive material and has a predetermined level of viscosity. Claim 20 discloses a fuel cell manufactured according to claim 18.

19, 20 (partly)

Claim 19 discloses a method of forming the conductive layer by first forming a conductive film of an electrically conductive material before transferring said *conductive* film onto the electrolyte layer.

Claim 20 discloses a fuel cell manufactured according to claim 19.

1, 21

Claim 21 discloses the pores are through-holes.

They are not so linked as to form a single general inventive concept (Rule 13.1 PCT) for the following reasons:

The common concept linking together the 8 inventions is a manufacturing method of a fuel cell, comprising the steps of forming a thin electrolyte layer having pores on an hydrogen

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permeable metal layer and then forming a conductive layer on the thin electrolyte layer electronically-discontinued with the hydrogen-permeable metal layer via the pores, wherein the conductive layer has electrical conductivity.

common concept cannot be distinguished over the prior art and is still already known

from document US2002/0028367, which discloses (page 7, §81 and page 8, §87) a method of manufacturing a fuel cell comprising the steps of forming a porous *electrolyte* layer on a Pd anode and then spraying a layer of Pt as cathode on said formed *electrolyte* layer.

Moreover any fuel cell manufacturing method intends implicitly to prevent a potential short-circuit by avoiding an electrical connection between anode and electrode, and the hydrogen permeable metal layer and the conductive layer can act as anode and cathode *respectively* (see description on page 12, lines 4-5 and page 14, lines 12-13).

The essential feature of the first invention is the formation of the *conductive* layer by releasing a conductive material toward the electrolyte layer in a direction perpendicular to the *electrolyte* layer to form the *conductive* layer thinner than the electrolyte layer. The problem solved is to make the conductive layer formed on the electrolyte layer discrete. from the conductive layer of the *electrically conductive* material formed inside the pores of the electrolyte layer (see description on page 3, lines 10-13).

The essential feature of the second invention is the formation of the conductive layer by releasing a *conductive* material toward the electrolyte layer at a specific angle. The problem solved is the prevention of the deposition of the electrically conductive material on the hydrogen permeable metal layer exposed on the pores in the electrolyte layer (see description from page 3, line 25 to page 4, line 1).

The essential feature of the third invention is the formation of the *conductive* layer by first forming a *dielectric* layer in the pores present in the electrolyte layer, said dielectric layer being made mainly of an insulating material, before coating the electrolyte layer and the *dielectric* layer with the *conductive* layer. The problem solved is to block off a connection between surface of the hydrogen metal layer, which is exposed on the pores present in the *electrolyte* layer, and outside of the pores (see description on page 5, lines 5-7).

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The essential feature of the fourth invention is the formation of the conductive layer by first filling the pores present in the electrolyte layer with fine particles, forming the conductive layer on the electrolyte layer having the pores filled with the fine particles and removing the fine particles from the pores. The problem solved is to remove the part of the conductive layer covering over the fine particles in the pores while removing the fine particles from the pores of the electrolyte layer, thereby enhancing the reliability of insulation between the conductive layer and the hydrogen permeable metal layer (see description on page 6, lines 10-14).

The essential feature of the fifth invention is the formation of the conductive layer by first forming a protective layer to cover the electrolyte layer before forming the conductive layer on the protective layer. The problem solved is to prevent the electrically conductive material from entering the pores of the electrolyte layer in the course of formation of the conductive layer (see description on page 7, lines 3-5).

The essential feature of the sixth invention is the formation of the conductive layer by coating the electrolyte layer with particles of an electrically conductive material having a greater particle diameter than a width of the pores present in the electrolyte layer. The problem solved is to prevent the electrically conductive material from entering the pores of the electrolyte layer (see description on page 8, lines 2-3).

The essential feature of the seventh invention is the formation of the conductive layer by applying a paste, which contains an electrically conductive material and has a predetermined level of viscosity. The problem solved is to prevent the paste containing the electrically conductive material from entering the pores of the electrolyte layer by regulating the viscosity of the paste (see description on page 8, lines 17-21).

The essential feature of the eighth invention is the formation of the conductive layer by first forming a conductive film of an electrically conductive material before transferring said conductive film onto the electrolyte layer. The problem solved is the improvement of the mutual bonding power of the particles of the electrically conductive material, thus preventing the electrically conductive material from entering the pores of the electrolyte layer in the process of transferring the conductive film onto the electrolyte layer (see description on page 9, lines 4-8).

The essential feature of the ninth invention is the formation of electrolyte layer, wherein the electrolyte layer has pores that are through-holes.

Applicant is advised that the reply to this requirement to be complete must include (i) an election of a species or invention to be examined even though the requirement may be traversed (37 CFR 1.143) and (ii) identification of the claims encompassing the elected invention.

The election of an invention or species may be made with or without traverse. To preserve a right to petition, the election must be made with traverse. If the reply does not distinctly and specifically point out supposed errors in the restriction requirement, the election shall be treated as an election without traverse.

3. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Angela J. Martin whose telephone number is (571)272-1288. The examiner can normally be reached on Monday-Friday from 10:00 am to 6:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AJM
/Angela J. Martin/
Examiner, Art Unit 1795